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Studies on the Rocky Mountain Flora.—III

By P. A. Rydberg

SOME SMALLER GENERA OF COMPOSITES

STENOTUS Nutt.

This genus was established by Nuttall in 1840. It was retained as a genus by Torrey and Gray in their Flora, but merged with several others into *Aplopappus* by Gray in his Synoptical Flora. A few years ago (1894), Professor Greene reëstablished the genus, removing from it, however, a member erroneously placed in the genus by Torrey and Gray, viz., *Stenotus pygmaeus* Torrey and Gray (*Aplopappus pygmaeus* Gray), which he referred to *Macronema*.* If such a transfer was the very best is questionable, for that species is as much a stranger in *Macronema* as it is in *Stenotus*. It has the outer bracts foliaceous and the style-appendages long and attenuated which are characters found in *Macronema;* but the habit is very unlike *Macronema* and the outer foliaceous bracts are numerous as in *Pyrrocoma*. I had some transient thought of transferring it to that genus; but the purely white pappus, the densely cespitose habit, and the lack of the thick taproot, debar it from *Pyrrocoma*. These characters ally it to *Solidago;* but the difference in structure of the outer and the inner bracts makes it unnatural to place it there as well. It is very hard to decide which would be the best course to take, either to place it as an anomalous member of one of these genera or to make it the type of a new genus. Perhaps some other and better relationship may be found.

Of the other species included in Aplopappus § Stenotus by Gray, *A. Parryi* is, I think, rightly referred to *Solidago*. *A. Lyallii* was altogether omitted by Professor Greene, when he made the segregation in Pittonia. He may have overlooked this, but it is more probable that he omitted it, because he did not know where to place it. The relationship is without any doubt closest with *Solidago*, notwithstanding the solitary head.

* In a recent distribution of plants from Colorado determined by Professor Greene, this was distributed under its original name *Stenotus pygmaeus*.

By removing *Stenotus linearifolius* Torr. & Gray and *S. interior* Greene, which constitute a good genus, the genus *Stenotus* becomes a very natural one, with only one somewhat aberrant member, *S. lanuginosus* which approaches *Pyrrocoma inuloides* and its relatives in habit.

The Rocky Mountain species are distinguished as follows:

Plant glabrous or puberulent; leaves firm and evergreen.
- Leaves linear to filiform. — 1. *S. stenophyllus.*
- Leaves mostly oblanceolate.
 - Bracts lanceolate, acute.
 - Plant puberulent.
 - Bracts in 3 series, broad, with broad scarious margins. — 2. *S. acaulis.*
 - Bracts in 2 series, narrow, with narrow scarious margins. — 3. *S. Andersonii.*
 - Plant glabrous.
 - Stem-leaves oblanceolate, 1–2 cm. long. — 4. *S. caespitosus.*
 - Stem-leaves linear, 4–7 cm. long. — 5. *S. falcatus.*
 - Bracts oval or oblong, very obtuse. — 6. *S. armerioides.*

Plant floccose; leaves softer, not evergreen. — 7. *S. lanuginosus.*

1. STENOTUS STENOPHYLLUS (A. Gray) Greene, Erythea, **2**: 72. 1894

Aplopappus stenophyllus A. Gray, U. S. Expl. Exp. **17**: 347. 1862–74.

This species grows on stony hills and mountains and ranges from western Idaho and Washington to California.

2. STENOTUS ACAULIS Nutt. Trans. Am. Phil. Soc. II. **7**: 334. 1840

Chrysopsis acaulis Nutt. Journ. Phil. Acad. **7**: 33. 1834.

Aplopappus acaulis A. Gray, Proc. Am. Acad. **7**: 353. 1867.

This is a rather common species, growing on dry rocky hills and mountains at an altitude of 1000–2500 m., from Saskatchewan and Washington to Wyoming and California.

3. **Stenotus Andersonii** sp. nov.

A puberulent, cespitose, but less woody perennial than the preceding and the three next following species. Flowering stems about 1 dm. high, leafy at the base, few-leaved above: leaves narrowly oblanceolate, not very rigid, distinctly 3-ribbed, 3–5 cm. long, 3–4 mm. wide: bracts narrowly lanceolate, acute, glandular

puberulent, with a very narrow scarious margin, imbricated in 2 series: achenes somewhat fusiform, about 4 mm. long, grayish or white villous as in the other species.

This species is nearest related to the preceding, but characterized by the less rigid leaves, the fewer and narrower involucral bracts, the involucre being more that of *S. lanuginosus*.

The type was collected on dry open hills.

MONTANA: Belt Mountains, 1886, *F. W. Anderson, 3561.**

4. STENOTUS CAESPITOSUS Nutt. Trans. Am. Phil. Soc. II. **7**: 335. 1840

Chrysopsis caespitosa Nutt. Jour. Acad. Phila. **7**: 33. 1834.

Aplopappus acaulis var. *glabratus* D. C. Eaton, King's Exped. **5**: 161. 1871.

This grows on dry hills and mountains, at an altitude of 1000–3000 m., from Montana and Idaho to Nevada, Arizona and Wyoming.

5. **Stenotus falcatus** sp. nov.

A glabrous cespitose perennial, with a woody caudex, resembling *S. armerioides* in habit. Flowering stems 10–15 cm. high, leafy, 1–3-cephalous: basal leaves oblanceolate, rigid, obtuse or acute, 4–5 cm. long, 4–6 mm. wide, 3-ribbed; stem leaves linear, 4–7 cm. long, 2–3 mm. wide, more or less falcate: heads about 1 cm. high: bracts lanceolate, acute, with scarious margin: rays 6–7 mm. long, 2.5–3 mm. wide.

This species differs from *S. armerioides*, which it closely resembles in the narrower and acute involucral bracts. It grows in barren soil at an altitude of about 1500 m.

UTAH: Red Creek, 1877, *Dr. E. Palmer, 202* (type); Milford, 1880, *M. E. Jones, 1804.*

6. STENOTUS ARMERIOIDES Nutt. Trans. Am. Phil. Soc. II. **7**: 335. 1840

Aplopappus armerioides A. Gray, Syn. Fl. **1**^{2}: 132. 1884.

This species grows on dry hills and bad-lands, at an altitude of 1000–2000 m., from Manitoba and Assiniboia to Utah, New Mexico and western Nebraska.

* Unless otherwise stated, the types of the new species described are preserved in the herbaria of the New York Botanical Garden or of Columbia University.

7. STENOTUS LANUGINOSUS (A. Gray) Greene, Erythea, **2**: 72. 1894.

Aplopappus lanuginosus A. Gray, U. S. Expl. Exped. **17**: 347. 1862–74.

This species is a rather anomalous member of the genus, as the leaves are not rigid, and scarcely evergreen. In habit it resembles somewhat some species of *Pyrrocoma*, as for instance, *P. inuloides;* but it has the thin involucral bracts and the white pappus of *Stenotus*. It grows on the mountains of Washington, northern Idaho and Montana.

Stenotopsis gen. nov.

Low shrubs with fastigiate branches, narrow fasciculate glandular punctate leaves and large peduncled heads. Involucre broadly hemispherical; its bract subequal, almost in a single series, linear lanceolate, thin scarious-margined, not at all hebaceous. Receptacle naked, alveolar. Ray-flowers about 12, ligulate, yellow, large, pistillate and fertile. Disk-flowers perfect: their corollas tubular-trumpet shaped, deeply 5-lobed. Anthers obtuse at the base. Style branches stigmatic their whole length, with ovate to lanceolate-subulate appendages. Achenes densely silvery-villous. Pappus of white capillary bristles, rather deciduous.

The genus contains two known species. It differs mainly from *Stenotus* in its shrubby habit and glandular punctate leaves.

Leaves 3–4 cm. long; rays 11–14 mm. long.	1. *S. linearifolius.*
Leaves 1–2 cm. long; rays 9–11 mm. long.	2. *S. interior.*

1. **Stenotopsis linearifolia** (DC.)

Aplopappus linearifolius DC. Prod. **5**: 347. 1836.

Stenotus linearifolius Torr. & Gray, Fl. N. Am. **2**: 238. 1842.

This species is a shrub 3–10 dm. high, and grows on dry hills, from Utah to California and Arizona.

2. **Stenotopsis interior** (Coville)

Aplopappus interior Coville, Proc. Biol. Soc. Wash. **7**: 65. 1892.

Stenotus interior Greene, Erythea, **2**: 72. 1892.

Its range is further southwest, from southern Utah to Arizona and southern California.

MACRONEMA Nutt.

This genus was also established by Nuttall in 1840 and re-established by Greene. The latter included, as is stated before, also *Stenotus pygmaeus* Nutt. (*Aplopappus pygmaeus* A. Gray). As the relationship of that species is rather doubtful, I have not included it in the treatment below. The species can be separated as follows:

Heads radiate.	
Heads small, fastigiate clustered; disk 5–8 mm. in diameter.	
Leaves broadly obovate, mucronate-cuspidate.	1. *M. obovatum.*
Leaves oblanceolate, acute or pointed.	2. *M. Watsonii.*
Heads larger, solitary: disk 1 cm. or more in diameter.	
Leaves oblanceolate, acute.	3. *M. suffruticosum.*
Leaves spatulate, obtuse or mucronate.	4. *M. grindelifolium.*
Heads discoid.	
Leaves oblong-oblanceolate.	
Outer bracts oblong, acute.	5. *M. discoideum.*
Outer bracts broadly oblong, obtuse.	6. *M. obtusum.*
Leaves linear.	7. *M. lineare.*

1. **Macronema obovatum** sp. nov.

A glandular-puberulent undershrub, 2–3 dm. high, with light yellow bark on the branches. Leaves broadly obovate, 1–2 cm. long, 7–10 mm. wide, mucronate-cuspidate: heads usually 2–3 together, about 10 mm. high, and 8 mm. broad: its bracts firmer than in the other species, oblong-linear, abruptly obcuneate-acute at the apex, unequal, imbricated in about 4 series: rays short, 4–5 mm. long and 1–1.5 mm. wide, about 10 in number.

The species is nearest related to *M. Watsonii*, differing mainly in the broad leaves and the abruptly acute bracts. The type was collected at an altitude of 1600 m.

UTAH: City Creek Cañon, *M. E. Jones, 1081.*

2. MACRONEMA WATSONII (A. Gray) Greene, Erythea, **2**: 74. 1894

Aplopappus Watsonii A. Gray, Proc. Am. Acad. **16**: 79. 1881.

This grows on mountains at an altitude of 2000–2500 m., in Utah and Nevada.

3. MACRONEMA SUFFRUTICOSUM Nutt. Trans. Am. Phil. Soc. II. **7**: 322. 1840

Aplopappus suffruticosus A. Gray, Proc. Am. Acad. **6**: 542. 1865.

This species grows in the mountains of Oregon and California up to an altitude of 3000 m. It has also been reported from Wyoming, but possibly some specimens of the next have been mistaken for it.

4. MACRONEMA GRINDELIOIDES Rydberg, Mem. N. Y. Bot. Garden, **1**: 384. 1900

The habitat of this species is rocky places on mountain-sides, at an altitude of 2500–3000 m. It grows in Montana, Idaho and northern Wyoming.

5. MACRONEMA DISCOIDEUM Nutt. Trans. Am. Phil. Soc. II. **7**: 322. 1840

Aplopappus Macronema A. Gray, Proc. Am. Acad. **6**: 542. 1864.

This species grows on the higher mountains at an altitude of 2500–3000 m., from Wyoming and Colorado to California.

6. **Macronema obtusum** sp. nov.

A dense glandular-pubescent undershrub, 2–4 m. high, with white-tomentose branches. Leaves oblong-oblanceolate, about 3 cm. long and 6 mm. wide, obtuse or mucronate: heads about 18 mm. high, 10–18 mm. in diameter: their bracts linear, acute, scarcely more than half as long as the flowers, subequal, except the outermost, which are foliaceous, broadly oblong, obtuse or mucronate: rays none.

The species is closely related to the preceding, differing in the stouter habit and the larger and broader, more obtuse outer bracts. It grows on high mountains at an altitude of about 2500 m.

COLORADO: South Cottonwood Gulch, 1892, *C. S. Sheldon, 5838* (type); Twin Lakes, 1873, *John Wolfe, 451*.

7. MACRONEMA LINEARE Rydb. Mem. N. Y. Bot. Garden, **1**: 384. 1900

In habit, this species resembles some species of *Chrysothamnus* and Prof. Aven Nelson insists that it should be referred to that genus. It has, however, the foliaceous outer bracts and long style-appendages of *Macronema* and is clearly congeneric with the two preceding species. It cannot very well be referred to *Chrysothamnus*, for it lacks the most essential character of the genus, viz., the

arrangement of the involucral bracts in distinct vertical rows. It grows in gravelly places in northern Wyoming, at an altitude of 2000–2500 m.

SIDERANTHUS Fraser

The name *Sideranthus* appears first in Fraser's Catalogue, but there only as a nomen nudum. Pursh in his Flora on page 750 gives *Sideranthus integrifolius* Fraser and *S. pinnatifidus* Fraser as synonyms of *Amellus villosus* and *A. spinulosus* described on page 564. There may be a doubt as to which of these should be regarded as the type of *Sideranthus*. *Amellus villosus* with its relatives was made a genus *Chrysopsis* by Nuttall in 1818 or by Elliott in 1824, according to different interpretations, long before *Eriocarpum* was established (1840). This leaves *Sideranthus pinnatifidus* as the residue of the genus *Sideranthus*. Besides Nuttall, who was the real author of Fraser's Catalogue, made *Sideranthus* a subgenus of *Dieteria* containing the only species *D. spinulosa* (*Aplopappus spinulosus* DC. See Trans. Am. Phil. Soc. II. **7**: 301); and thus shows that he regarded it as the type of *Sideranthus*.*

Leaves spinescent toothed, not pinnatifid.
- Heads discoid; perennial with woody caudex. — 1. *S. grindelioides.*
- Heads radiate; annual. — 2. *S. rubiginosus.*

Leaves pinnatifid.
- Stem more or less floccose, or cinereous especially when young.
 - Plant cinereous pubescent, more or less glandular. — 3. *S. australis.*
 - Plant more or less floccose, not at all glandular. — 4. *S. spinulosus.*
- Plant neither floccose nor cinereous.
 - Plant perfectly glabrous or sparingly glandular puberulent. — 5. *S. glaberrimus.*
 - Plant finely puberulent.
 - Heads hemispherical; bracts slightly glandular. — 6. *S. puberulus.*
 - Heads somewhat turbinate; bracts densely glandular puberulent. — 7. *S. turbinellus.*

1. **Sideranthus grindelioides** (Nutt.) Britton

Eriocarpum grindelioides Nutt. Trans. Am. Phil. Soc. II. **7**: 321. 1840.

Aplopappus Nuttallii Torr. & Gray, Fl. N. A. **2**: 240. 1842.

* Professor Greene (Pittonia **2**: 115) seems to think *Sideranthus* is derived from the Latin *sidus*, star, and the Greek, *ανθος*, flower. It is better to regard the first part also as Greek, *σιδήρος*, iron. Why accuse Nuttall of making a hybrid word, which we would not permit ourselves?

The species is not uncommon on barren hills and in bad-lands, up to an altitude of 1500 m. Its range extends from Saskatchewan and western Nebraska to Colorado and Arizona.

2. **Sideranthus rubiginosus** (Torr. & Gray) Britton

Aplopappus rubiginosum Torr. & Gray, Fl. N. Am. **2**: 240. 1842.

Eriocarpum rubiginosum (Torr. & Gray) Britton, Mem. Torr. Bot. Club, **5**: 316. 1894.

The species was first described as a perennial. Our plant is evidently only annual. Possibly two different species have been confused under the name *E. rubiginosum*. It grows in sandy soil from Texas to Colorado and western Nebraska, reaching an altitude of 1500 m.

3. **Sideranthus australis** (Greene)

Eriocarpum australe Greene, Erythea, **2**: 108. 1894.

This grows on the plains of western Texas, Colorado, New Mexico and Mexico.

4. SIDERANTHUS SPINULOSUS (Pursh), Sweet, Hort. Brit. 227. 1826

Amellus spinulosus Pursh, Fl. Sept. Am. 564. 1814.

Sideranthus pinnatifidus Fraser; Pursh, Fl. Am. Sept. 750. 1814

Aplopappus spinulosus DC. Prod. **5**: 347. 1836.

Eriocarpum spinulosum (Pursh) Greene, Erythea, **2**: 108. 1894.

The species is rather common on plains and dry prairies, from Saskatchewan, Nebraska and Texas to Mexico, Arizona and Idaho.

5. **Sideranthus glaberrimus** sp. nov.

Perennial, with a short woody caudex, perfectly glabrous, or very sparingly glandular-puberulent. Stems several, branched above, very leafy, 1–3 dm. high: leaves rather rigid, about 2 cm. long, bluish green, glabrous, pinnatifid; segments oblong, 2–5 mm. long and 1 mm. or less wide, spinulose-tipped: heads numerous, corymbose, depressed hemspherical, 8–10 mm. high and 8–15 mm. broad: bracts imbricated in 6–7 series, the outer gradually shorter, firm, appressed, with a herbaceous tip, acute; the inner tinged with purplish: rays about 20, 4–5 mm. long and about 1 mm. wide.

The species is closely allied to the preceding, differing mainly in the total lack of tomentum, even when young, the bluer color and the smaller, generally purple-tinged bracts. It grows on plains and hills, from Iowa and Indian Territory to New Mexico and Wyoming.

KANSAS: Osborn City, 1894, *C. L. Shear, 116;* Harper, 1888, *W. A. Kellerman;* Hamilton Co., 1895, *Hitchcock, 222.*

NEBRASKA: 1893, *Rydberg, 1403a* (type); *G. D. Sweezey, 55.*

INDIAN TERRITORY: 1868, *Edward Palmer, 442.*

COLORADO: Platte, *Dr. James.*

WYOMING: Platte, *Fremont,* Dayton, 1899, *Tweedy, 2076.*

6. **Sideranthus puberulus** sp. nov.

A low densely puberulent perennial, less than 1.5 dm. high: Stems ascending, branched above: leaves 2–3 cm. long, pinnatifid or bipinnatifid; segments 1–5 mm. long, less than 1 mm. wide, spinulose-tipped: heads 2–4 in a small corymb, hemispherical, 8–9 mm. high, 10–12 mm. broad: bracts narrowly linear-lanceolate, appressed, acute, with small herbaceous tips, finely puberulent, but only slightly glanular: rays about 20, 8–9 mm. long and about 1.5 mm. wide.

This is perhaps nearest related to *E. australe;* but is easily distinguished by the fine pubescence.

COLORADO: Salida, *Mrs. C. B. Clarke, 174.*

7. **Sideranthus turbinellus** sp. nov.

A low and bushy puberulent perennial, 1.5–2 dm. high. Stems corymbosely branched and very leafy: leaves .5–2 cm. long, pinnatifid or the upper reduced and merely toothed; segments narrow, 1–5 mm. long, about .5 mm. wide: heads numerous, small, hemispherical-turbinate, 7–8 mm. high, and scarcely as broad: bracts imbricated in 6–7 series, linear-lanceolate, acute, appressed glandular-puberulent: rays 10–15, 7–8 mm. long and 1.5 mm. wide.

Perhaps nearest related *E. spinulosum,* the species is easily known by the small, somewhat turbinate heads and the dense and fine pubescence.

IDAHO: Pocatello, 1892, *A. Isabel Mulford.*

PYRROCOMA Hook.

This genus was established by Hooker in 1840, and based on one species, *P. carthamoides.* In 1894, Professor Greene extended the genus so as to include the genus *Homopappus* of Nuttall, the difference between the two genera being only that the ligules of the ray-flowers in the former are very small and inconspicous or wanting.

Heads apparently discoid, the sterile rays being concealed in the pappus.
- Inner bracts recurved cuspidate. 1. *P. subsquarrosa.*
- Bracts not recurved cuspidate.
 - Bracts oblong or oval; heads hemispherical.
 - Leaves and bracts more or less spinulose-toothed, the latter with a narrow scarious margin. 2. *P. carthamoides.*
 - Leaves and bracts not spinulose-toothed, the latter with a broad scarious erose margin.
 - Pappus sordid; plant almost glabrous. 3. *P. rigida.*
 - Pappus brownish red; plant villous. 4. *P. erythropappa.*
 - Bracts lanceolate; head campanulate-turbinate. 5. *P. Cusickii.*

Heads distinctly radiate.
- Bracts except the innermost obtuse, obovate or oblong. 6. *P. crocea.*
- Bracts mostly acute or acuminate.
 - Plant not glandular.
 - Heads large; disk 2 cm. or more in diameter; bracts in about 3 series.
 - Upper part of stem and involucre decidedly villous; bracts wholly foliaceous.
 - Bracts oblanceolate, abruptly acute. 7. *P. Clementis.*
 - Bracts lanceolate, long-acute. 8. *P. villosa.*
 - Stem and involucre almost glabrous; bracts chartaceous at the base with foliaceous tips. 9. *P. integrifolia.*
 - Heads smaller; disk less than 2 cm. in diameter.
 - Bracts in 2–3 unequal series.
 - Leaves 5–15 mm. wide; disk 1–2 cm. wide.
 - Inflorescence corymbiform; bracts long-acute. 10. *P. lanceolata.*
 - Inflorescence racemiform; bracts abruptly acute. 11. *P. Vaseyi.*
 - Leaves 2–4 mm. wide; disk 1 cm. or less wide. 12. *P. tenuicaulis.*
 - Bracts nearly of the same length.
 - Stem-leaves oblanceolate; bracts long-acuminate. 13. *P. acuminata.*
 - Stem-leaves lanceolate; bracts acute or short-acuminate.
 - Plant villous. 14. *P. inuloides.*
 - Plant, except the upper parts, glabrate in age. 15. *P. uniflora.*
 - Plant decidedly glandular. 16. *P. hirta.*

1. PYRROCOMA SUBSQUARROSA Greene, Erythea, **3**: 22. 1895

I have seen no specimen of this species; but the description indicates a plant wholly unlike the other species of the Rocky Mountains, that I do not hesitate in accepting it as a good species. The type of *P. subsquarrosa* was collected in northern Wyoming, by Dr. J. N. Rose in 1893.

2. PYRROCOMA CARTHAMOIDES Hook. Fl. Bor. Am. **1**: 307. 1833

Aplopappus carthamoides A. Gray, Proc. Acad. Sci. Phila. 1863: 65. 1864.

As treated by Dr. Gray, *A. carthamoides* comprises more than one species, and probably both of the two following species are covered by his description. There is no doubt, however, as to which species shall bear the name, for Hooker's description and figure point clearly to the plant with more or less spinulose-toothed leaves and bracts. The latter are also longer, narrower and more acute than in the other two species. *P. carthamoides* ranges from Alberta and British Columbia to Oregon and Idaho.

3. **Pyrrocoma rigida** sp. nov.

A perennial with a thick woody tap-root. Stems 1–3, erect or ascending, finely pubescent when young, glabrate in age, 2–4 cm. high, leaves pale bluish green, firm, oblanceolate, acute, entire-margined, finely puberulent, or glabrate; the lower petioled, 8–15 cm. long, 1.5–3 cm. wide; the upper smaller and sessile: heads apparently discoid, 15–20 mm. high, 15–25 mm. broad: bracts very firm, imbricated in 3–4 series, broadly oblong, acute or mucronate; the inner at least with broad scarious or semi-chartaceous margins, which generally are erose, but not spinulose-dentate: ligules of the ray-flowers erect, slightly longer than the light brownish or sordid pappus: achenes glabrous, shining.

In general habit, this species resembles closely *P. carthamoides* but has broader leaves and bracts, paler foliage and no indication of spinulose toothing. It grows in sandy places and meadows in Idaho, Montana and Washington.

IDAHO: Granite Station, Kotenay County, 1892, *Sandberg, MacDougal & Heller, 785* (type).

MONTANA: Columbia Falls, 1894, *R. S. Williams.*

WASHINGTON: Loomiston, 1897, *A. D. E. Elmer, 603.*

4. **Pyrrocoma erythropappa** sp. nov.

A finely villous pubescent perennial. Stem 1.5–3 dm. high, with 1–4 heads: stem-leaves 3–6 cm. long, 1–1.5 cm. wide, firm, oblanceolate or oblong, acute, subsessile, finely pubescent, or glabrate on the upper surface: heads very short-peduncled in the axils of the upper leaves, 10–15 mm. high, about 15 mm. in diameter: bracts imbricated in 4–5 series, pubescent, broadly oval or oblong, obtuse, mucronate, or the outer acute, with a thin erose margin: pappus intensely brownish red: otherwise as the preceding.

IDAHO: Clear Water, *Rev. Spalding* (type in Torrey Herbarium).

5. PYRROCOMA CUSICKII (A. Gray) Greene, Erythea, **2**: 59. 1894

Aplopappus carthamoides var. *Cusickii* A. Gray, Syn. Fl. **2**[1]: 126. 1886.

The range of this species is limited to Oregon and western Idaho.

6. PYRROCOMA CROCEA (A. Gray) Greene, Erythea, **2**: 69. 1894

Aplopappus croceus A. Gray, Proc. Acad. Sci. Phila. 1863: 65. 1864.

This species is not uncommon in the mountain regions of Colorado at an altitude of 1800–3000 m.

7. **Pyrrocoma Clementis** sp. nov.

A perennial with more or less villous ascending stem, 1.5–4 dm. high: lower stem-leaves linear-oblong, about 1 dm. long, somewhat fleshy, glabrous except the ciliate margin, saliently dentate; the upper lanceolate or ovate-lanceolate, more or less auricled at the base, dentate or entire-margined; heads solitary; disk about 15 mm. high and 2.5–3 cm. broad: bracts all foliaceous, imbricated in 3–4 series, but the outer almost equaling the inner, oblanceolate, abruptly acute, villous: rays 10–12 mm. long and 2–3 mm. wide, bright yellow: achenes sparingly strigose-hirsute: pappus yellowish white.

COLORADO: Mt. Harvard, 1896, *Frederick Clements, 44.*

8. **Pyrrocoma villosa** sp. nov.

A low perennial with a thick woody tap-root. Stems 1–3, ascending, 1–1.5 dm. high, purplish, more or less villous, especially above: basal leaves oblanceolate, 7–10 cm. long, 1–1.5 cm. wide, somewhat glaucous and rigid, entire-margined or occasionally slightly spinulose denticulate; stem-leaves linear-lanceolate, 2–4 cm. long: heads solitary: disk about 2 cm. broad: bracts foliaceous, imbricated in 3–4 series, but the outer fully as long as the inner, broadly linear or lanceolate, long-acute, more or less villous: rays about 1 cm. long and 2 mm. wide: achenes glabrous: pappus dirty white.

In habit this species resembles most *P. uniflora* and *P. inuloides;* but is easily distinguished by the larger heads and the foliaceous bracts in several series. It grows in meadows at an altitude of about 2700 m.

WYOMING: Willow Creek, Big Horn Mountains, 1899, *F. Tweedy, 2063.*

9. PYRROCOMA INTEGRIFOLIA (Porter) Greene, Erythea, **2**: 69. 1894

Aplopappus integrifolius Porter; A. Gray, Proc. Am. Acad. **16**: 79. 1881.

This species grows in meadows, at an altitude of 1000–2500 m., from Saskatchewan to Idaho and Wyoming.

Pyrrocoma integrifolia pumila var. nov.

Pyrrocoma Howellii Rydb. Mem. N. Y. Bot. Garden, **1**: 382. 1900. Not A. Gray.

Stem low, 1 dm. or less, monocephalous; bracts shorter and less acute.

MONTANA: Butte, 1895, *Rydberg, 2808.*

10. PYRROCOMA LANCEOLATA (Hooker) Greene, Erythea, **2**: 69. 1894

Donia lanceolata Hook. Fl. Bor. Am. **2**: 25. 1834.

Aplopappus lanceolatus Torr. & Gray, Fl. N. Am. **2**: 241. 1842.

The range of this species is from Saskatchewan to British Columbia, Nevada and Wyoming. It ascends to an altitude of 2000 m.

11. **Pyrrocoma Vaseyi** (Parry)

Aplopappus lanceolatus var. *Vaseyi* Parry; D. C. Eaton, King's Exped. **5**: 160. 1871.

I believe that this deserves a specific rank, as the racemose disposition of the heads is accompanied with shorter, closer and oblanceolate, abruptly acute bracts. It ranges from Saskatchewan (according to Gray) south to Utah and Colorado.

12. PYRROCOMA TENUICAULIS (D. C. Eaton) Greene, Erythea, **2**: 69. 1894

Aplopappus tenuicaulis D. C. Eaton, King's Exped. **5**: 160. 1871.

Aplopappus lanceolatus var. *tenuicaulis* A. Gray, Syn. Fl. **2**[1]: 129. 1884.

This grows in alkali meadows of Utah, Nevada and Oregon, at an altitude of about 2000 m.

13. **Pyrrocoma acuminata** sp. nov.

A low finely villous perennial with a woody tap-root. Stems several, slender, about 1 dm. high, monocephalous: leaves nar-

rowly linear-oblanceolate, with strong midrib, 2–4 cm. long, 2–4 mm. wide, entire-margined, acute, finely villous on both sides: heads on naked peduncles, which are 3–4 cm. long: disk about 1 cm. high and 12–15 mm. broad: bracts in about 2 series, broadly lanceolate, contracted into a long slender tip: rays about 1 cm. long and 1.5 mm. wide: achenes pubescent: pappus tawny.

In habit this species resembles most *P. inuloides*, but differs in the smaller leaves, the shorter pubescence and the acumination of the bracts.

WYOMING: Fort Bridger, 1873, *Dr. J. V. Carter* (type in Columbia Herbarium).

14. PYRROCOMA INULOIDES (Hook.) Greene, Erythea, **2**: 60. 1894

Donia inuloides Hook. Fl. Bor. Am. **2**: 25. 1834.

Aplopappus inuloides Torr. & Gray, Fl. N. Am. **2**: 241. 1842.

Dr. Gray included this in *A. uniflorus*, but I agree with Professor Greene that it ought to be kept distinct. It ranges from Montana to Idaho and Wyoming.

15. PYRROCOMA UNIFLORA (Hook.) Greene, Erythea, **2**: 60. 1894

Donia uniflora Hook. Fl. Bor. Am. **2**: 25. 1834.

Aplopappus uniflorus Torr. & Gray, Fl. N. Am. **2**: 241. 1842.

This species grows in alkaline meadows, up to an altitude of 2500 m., and ranges from Saskatchewan and Montana to Utah and Colorado.

16. PYRROCOMA HIRTA (A. Gray) Greene, Erythea, **2**: 69. 1894

Aplopappus hirtus A. Gray, Syn. Fl. **2**^{1}: 127. 1884.

The range of this species includes eastern Oregon, Washington and western Idaho, where it reaches an altitude of 1000 m.

BALSAMORRHIZA Hook.

Leaves entire or bluntly toothed, never pinnatifid.
- Plant white-tomentose.
 - Leaves with entire margins or slightly undulate, oblong-cordate to hastate. 1. *B. sagittata.*
 - Leaves more or less distinctly toothed, ovate-lanceolate, with subcordate base. 2. *B. tomentosa.*
- Plant hirsute puberulent; basal leaves cordate.
 - Rays linear, deciduous; achenes glabrous. 3. *B. deltoidea.*
 - Rays oval, becoming papery, and more or less persistent: achenes puberulent. 4. *B. Careyana.*

Leaves mostly pinnatifid or at least incisedly toothed.
Plant canescent or white-tomentose.
Plants loosely white-tomentose.
Stem 1–3 dm. high; segments of the leaves 1–3 cm. long, ovate, entire or slightly toothed. 5. *B. incana.*
Stem 3 dm. or more high; segments of the leaves 3–5 cm. long, lanceolate, coarsely toothed. 6. *B. floccosa.*
Plant finely canescent, tomentose only on the involucre; some of the leaves merely toothed. 7. *B. terebinthacea.*
Plants more or less hispid, neither canescent nor tomentose.
Disk 3–4 cm. broad; segments of the leaves mostly entire. 8. *B. macrophylla.*
Disk 2–2.5 cm. broad; segments of the leaves mostly toothed. 9. *B. hirsuta.*

1. BALSAMORRHIZA SAGITTATA (Pursh) Nutt. Trans. Phil. Soc. II. 7: 350. 1840

Bupthalmium saggittatum Fl. Am. Sept. 564. 1814.

Growing on hillsides at an altitude of 1000–2500 m., this species is not uncommon from Alberta and British Columbia to California, Colorado and the Black Hills of South Dakota.

2. **Balsamorrhiza tomentosa** sp. nov.

A white-tomentose perennial with thick root; but the tomentum is shorter and finer than in *B. sagittata.* Basal leaves with long petioles; blades about 12 dm. long, ovate-lanceolate with subcordate bases, 15–20 cm. long, acute, coarsely toothed; stem-leaves generally two, including the slender petioles about 1 dm. long, lanceolate to linear elliptic, acute at both ends: stem 3–4 dm. high, involucre densely floccose, over 2 cm. broad: outer bracts half longer than the inner, reflexed: rays about 3 cm. long and 1 cm. wide; achenes glabrous.

Closely related to *B. sagittata* this species differs mainly in the toothed leaves, shorter tomentum and longer outer bracts.

WYOMING: Headwaters of Tongue River in the Big Horn Mountains, 1898, *F. Tweedy, 10.**

3. BALSAMORRHIZA DELTOIDEA Nutt. Trans. Am. Phil. Soc. II. 7: 351. 1840

The name of this plant is rather unfortunate, as the leaves are rarely deltoid, but on the contrary usually broadly cordate. *B. deltoidea* ranges from British Columbia to California and Idaho.

*A specimen collected by Tweedy on Teepee Creek in 1899 (*no. 2114*), may also belong here. It has smaller heads, not reflexed bracts and lanceolate leaves.

4. BALSAMORRHIZA CAREYANA A. Gray, Pl. Fendl. 81. 1849

This species grows on sandy plains of Idaho and Washington.

5. BALSAMORRHIZA INCANA Nutt. Trans. Am. Phil. Soc. II. **7**: 350. 1840

Balsamorrhiza Hookeri var. *incana* A. Gray, Syn. Fl. **2**[1]: 266. 1884.

This species grows on dry stony hills, up to an altitude of 2500 m., from Montana and Washington to California and Wyoming.

6. **Balsamorrhiza floccosa** sp. nov.

Balsamorrhiza Balsamorrhiza Rydb. Mem. N. Y. Bot. Garden, **1**: 417. 1900. Not *Heliopsis Balsamorrhiza* Hook.

A loosely white or gray-tomentose perennial with very thick tap-root. Leaves mostly basal, floccose on both sides, 2–3 dm. long, regularly pinnately divided to near the midrib: some sometimes only coarsely toothed: segments lanceolate, acute, 3–5 cm. long coarsely toothed: stem-leaves 2, near the base, similar but smaller, about 1 dm. long: stem scapiform, 3–5 dm. high, villous or the upper portion densely floccose: involucre about 3 cm. broad, densely floccose; bracts numerous in several series, lanceolate; the outer often spreading with recurved tips; rays 3–4 cm. long, about 1 cm. wide; achenes glabrous, cuneate oblong, with truncate apex.

This species has been mistaken for *B. Balsamorrhiza* (Hook.) Heller or *B. Hookeri* Nutt., but the latter has much finer dissected leaves and its pubescence is quite different. The latter is very short and appressed, never consisting of long villous hairs, and there is never dense wool at the base of the head as in this species. *B. Balsamorrhiza* ranges from Washington to California; but is evidently not found in the Rocky Mountain region. All that I have seen from the region and referred to *B. Balsamorrhiza* by Heller, Holzinger and myself belong to *B. floccosa*. Those collected by Parry, and if I am not mistaken, named by Gray, belong to *B. incana*.

B. floccosa grows on hillsides at an altitude of 1000–2500 m. The following specimens are in the New York herbaria:

MONTANA: Spanish Basin, Gallatin Co., 1897, *Rydberg & Bessey, 5175* (type).

IDAHO: Lake Waha, 1896, *A. A. & E. Gertrude Heller, 3298;*

Craig Mountain near Lake Waha, 1892, *Sandberg, MacDougal & Heller, 248.*

WYOMING: Headwaters of Tongue River, Big Horn Mountains, 1898, *F. Tweedy, 11.*

7. BALSAMORRHIZA TEREBINTHACEA (Hook.) Nutt. Trans. Am. Phil. Soc. II. **7**: 349. 1840

Heliopsis? terebinthacea Hook. Fl. Bor. Am. **1**: 310. 1833.

In this species, as well as in the next, it often occurs that some of the leaves are not pinnatifid, but merely coarsely dentate. It is a rare plant growing in stony soil in eastern Oregon and western Idaho.

8. BALSAMORRHIZA MACROPHYLLA Nutt. Trans. Am. Phil. Soc. II. **7**: 350. 1840

This grows on rocky hillsides in Wyoming, Utah and Idaho.

9. BALSAMORRHIZA HIRSUTA Nutt. Trans. Am. Phil. Soc. II. **7**: 349. 1840

This species is found at an altitude of 1000–2000 m. in the dry regions of Utah to British Columbia and California.

THELESPERMA Less.

Heads radiate.
- Leaf-segments linear-filiform, 1 mm. or less wide.
 - Annual or biennial; outer bracts subulate-linear, more than half as long as the inner. 1. *T. trifidum.*
 - Perennial from a rootstock: outer bracts linear-lanceolate, half as long as the inner or less. 2. *T. tenue.*
- Leaf-segments linear, over 1 mm. wide; plant perennial or the first only biennial.
 - Plant with tap-root, leafy throughout. 3. *T. intermedium.*
 - Plant with creeping rootstock or woody caudex; leafy only near the base.
 - Involucre not cleft below the middle; throat of the disk-flowers campanulate, shorter than the lobes. 4. *T. ambiguum.*
 - Involucre cleft below the middle; throat of the disk-flowers cylindraceous, longer than the lobes. 5. *T. subnudum.*

Heads discoid; perennials with rootstock or woody caudex.
- Plant less than 2 dm. high; involucre with very broad scarious margins. 6. *T. marginatum.*
- Plants 3–6 dm. high; involucre with very narrow scarious margins. 7. *T. gracile.*

1. THELESPERMA TRIFIDUM (Poir.) Britton, Trans. N. Y. Acad. Sci. **9**: 182. 1890

Coreopsis trifida Poir. Suppl. Lam. Encycl. **2**: 353. 1811.

Thelesperma filifolium A. Gray, Kew Journ. Bot. **1**: 253. 1849.

This species grows in dry soil from Nebraska to Texas and eastern Colorado.

2. **Thelesperma tenue** sp. nov.

A slender, glabrous plant with perennial rootstock. Stems 1–3, slender, less than 2 mm. in diameter, light green, mostly simple and leafy to near the top, 1.5–4 dm. high: leaves twice pinnately dissected into linear filiform segments, mostly appressed to the stem: peduncles 1–3, 5–10 cm. long: outer bracts 6–8, linear-lanceolate, half as long as the inner or less; the inner united to the middle, broadly scarious-margined: rays 8–12 mm. long, 4–6 mm. wide: awns of the pappus very short, about half as long as the width of the summit of the dark shining achenes.

This species resembles most the preceding but has a simpler stem and perennial rootstock. It grows in sandy soil at an altitude of about 2800 m.

COLORADO: Veta Pass, 1900, *Rydberg & Vreeland, 5473* (type); 1870, *Dr. G. W. Hulse*; Plains, 1871, *Wm. M. Canby.*

3. **Thelesperma intermedium** sp. nov.

A glabrous bushy plant with a biennial or perhaps perennial tap-root. Stems several, much branched and very leafy, 2–6 dm. high: leaves once or twice pinnately divided into linear segments, 1–3 mm. wide: peduncles very numerous, 1–1.5 dm. long: involucre about 1 cm. broad: outer bracts very narrowly linear-lanceolate, about half as long as the inner; these united to about the middle, scarious-margined: rays 10–12 mm. long, 6–8 mm. wide, rounded, 3-toothed at the apex: teeth of the pappus longer than the width of the achenes.

This has been confused with *T. ambiguum*, but is of a quite different habit. *T. intermedium* is much branched and very leafy throughout, has a vertical tap-root of short duration, numerous heads, rather long outer bracts and the inner with narrow scarious margins. *T. ambiguum* is leafy only at the base, has a creeping rootstock, very short outer bracts and the inner with a very broad scarious margin.

T. intermedium grows in sandy or loose soil, often taking possession of old fields and acts much like a weed. The following specimens are at hand.

NEBRASKA: Banner County, 1890, *Rydberg, 192* (type); Crawford, 1889, *H. J. Webber.*

WYOMING: Pine Bluffs, 1897, *Aven Nelson, 3503.*

COLORADO: 1862, *Hall & Harbour, 280,* at least in part.

COLORADO or WYOMING: 1843, *Fremont.*

NEW MEXICO: Between Santa Fe and Canoncito, 1897, *A. A. & E. Gertrude Heller, 3747.*

4. THELESPERMA AMBIGUUM A. Gray, Proc. Am. Acad. **19**: 16. 1883

This species seems to be confined to the plains of western Texas, New Mexico and southern Colorado. The specimens reported from Nebraska and Wyoming belong mostly to the preceding, and those from Montana to *T. marginatum.* The latter resembles *T. ambiguum* in many respects, especially as to the involucral bracts; but it is always without ray-flowers.

5. THELESPERMA SUBNUDUM A. Gray, Proc. Am. Acad. **10**: 72. 1874

This is an inhabitant of the more arid regions of New Mexico, Arizona, Utah and Colorado.

6. THELESPERMA MARGINATUM Rydb. Mem. N. Y. Bot. Garden, **1**: 421. 1900

This grows on dry plains of Alberta and Montana.

7. THELESPERMA GRACILE (Torr.) A. Gray, Kew Journ. Bot. **1**: 253. 1849

Bidens gracilis Torr. Ann. Lyc. N. Y. **2**: 215. 1827.

This species is the most common and most widely distributed species of the genus. It is common on dry plains from Nebraska to Montana, Arizona, Mexico and Texas.

HYMENOPAPPUS L'Her.

Throat of the corolla 1–1.5 mm. long, not over twice as long as the lobes.
Pappus over 1 mm. long, equaling the corolla-tube or nearly so.
Stem 3–6 dm. high, leafy throughout; heads numerous.

Plant sparingly and loosely floccose; leaves glabrate in age. 1. *H. tenuifolius.*

Plant densely tomentose; leaves permanently tomentose. 2. *H. tomentosus.*

Stem less than 3 dm. high.

Stem-leaves much reduced; stem white-tomentose or nearly so; heads few. 3. *H. scaposus.*

Stem-leaves not much reduced; stem sparingly grayish tomentose. 5. *H. cinereus.*

Pappus 1 mm. or less long, shorter than the corolla-tube; stem-leaves and heads few.

Pappus not hidden by the hairs of the achenes.

Stem permanently densely white-tomentose; achenes silky. 4. *H. arenosus.*

Stem sparingly grayish tomentose, glabrate in age; achenes loosely villous 5. *H. cinereus.*

Pappus hidden by the hairs of the achenes, or sometimes none.

Leaflets glabrate in age, at least above; ultimate segment 5–30 mm. long. 6. *H. filifolius.*

Leaves permanently densely white-tomentose; ultimate segments short, 1–5 mm. long. 7. *H. luteus.*

Throat of the corolla 3–4 mm. long, 3–4 times as long as the lobes. 8. *H. macroglottis.*

1. HYMENOPAPPUS TENUIFOLIUS Pursh, Fl. Am. Sept. 742. 1814

This is generally described as a biennial; occasionally the root is of a longer duration and the plant becomes a short-lived perennial and then hard to distinguish from a large specimen of *H. filifolius* except by the pappus. *H. tenuifolius* grows on prairies, from Nebraska and Wyoming to Texas.

2. **Hymenopappus tomentosus** sp. nov.

A densely and permanently white-tomentose plant, apparently biennial. Stem 3–4 dm. high, leafy and branched above: leaves 5–7 cm. long, bi-pinnately divided into linear segments, 4–10 mm. long, about 1 mm. wide: heads many, corymbose-paniculate, about 8 mm. high and broad; involucre densely woolly, somewhat turbinate: flowers yellow: corolla tube and throat each a little over 1 mm. long; the latter broadly campanulate, of about the same length as the lobes; achenes silky strigose; scales of the pappus a little shorter than the corolla-tube.

Nearest related to the preceding, this species is easily distinguished by the dense permanent tomentum and the yellow flowers.

UTAH: St. George, 1877, *Dr. E. Palmer, 270* (type in the Columbia Herbarium).

3. **Hymenopappus scaposus** sp. nov.

Hymenopappus luteus A. Gray, Pl. Fendl. 97. 1849. Not Nutt. 1841.

An almost scapose perennial with a cespitose caudex. Stem almost naked, with 1–2 reduced leaves, more or less densely tomentose: leaves mostly basal, 5–7 cm. long, bipinnately divided into linear segments, 3–10 mm. long, more or less densely tomentose, especially at the base: heads few, corymbose, hemispherical, about 1 cm. high and broad: bracts obovate with yellowish or purplish scarious margins: corollas yellow; tube and throat each nearly 2 mm. long; the latter campanulate and longer than the lobes: achenes densely silky, scales of the pappus fully 2 mm. long, longer than the tube of the corolla.

This species has been confused with *H. luteus* Nutt. but is easily distinguished by the long pappus and also by the longer segments of the leaves. *H. scaposus* grows in dry soil up to an altitude of 2200 m. from New Mexico and Arizona to Utah and Nevada.

ARIZONA: Vicinity of Flagstaff, 1898, *D. T. MacDougal, 129* (type).

NEW MEXICO: Santa Fee, 1897, *A. A. & E. Gertrude Heller, 3555;* 1847, *A. Fendler, 456;* 1869, *E. Palmer, 11.*

UTAH: Southern Utah, 1874, *C. C. Parry, 107.*

NEVADA: 1868, *S. Watson, 612.*

4. HYMENOPAPPUS ARENOSUS Heller, Bull. Torr. Club, **25**: 200. 1898

This resembles somewhat the preceding, but is taller, more leafy, and has much shorter pappus. It grows in sandy soil, up to an altitude of 2200 m., in New Mexico and southern Colorado.

5. **Hymenopappus cinereus** sp. nov.

A grayish tomentose perennial with a cespitose caudex. Stems about 2 dm. high, branched, with 2–4 leaves: these bi-pinnately divided into linear segments 1–2 cm. long and about 1 mm. wide, sparingly grayish tomentulose: heads corymbose, 8–10 mm. high, 10–12 mm. broad, hemispherical or somewhat turbinate: bracts oblong-obovate, with narrow scarious margins: corollas yellow: tube and throat each about 1.5 mm. long; the latter broadly campanulate, longer than the lobes: achenes loosely villous; scales of the pappus variable, in the type fully 1 mm. long and nearly equal-

ing the corolla-tube, but often shorter, yet never hidden by the hairs of the achenes.

This species has been confused with *H. filifolius* and *H. flavescens*. Baker, Earle & Tracy's specimens were determined as the latter by Professor Greene. The species is, however, much nearer related to *H. filifolius*, from which it differs mainly in the lower habit and the longer scales of the pappus. These characters, together with the longer lobes of the leaves distinguish it from *H. luteus*. It grows on dry hills, at an altitude of 1500–3000 m.

COLORADO: Walsenburg, 1900, *Rydberg & Vreeland, 5479* (type); Mesas near Pueblo, *5477;* Cuchara Valley, *5478;* Durango, 1898, *Baker, Earle & Tracy, 1028;* Garden of the Gods, near Pikes Peak, 1895, *E. A. Bessey.*

6. HYMENOPAPPUS FILIFOLIUS Hook. Fl. Bor. Am. **1**: 317. 1833

This species is common on plains and prairies to an altitude of 2000 m., and ranges from Saskatchewan and Montana to Colorado and Nebraska.

7. HYMENOPAPPUS LUTEUS Nutt. Trans. Am. Phil. Soc. (II.) **7**: 374. 1841

Dr. Gray in his Synoptical Flora referred this species to *H. filifolius*, which, however, does not fit Nuttall's description. Many years before he had named Fendler's specimens *H. luteus*. These agree fairly well with Nuttall's description, except as to the pappus, which in them is much more prominent than in any of the other species. Nuttall states that the scales of the pappus of *H. luteus* are very short and hidden by the hairs of the achenes.

In 1897 Prof. Aven Nelson collected a *Hymenopappus* on Green River, which he intended to describe as new, especially as the type specimen was without pappus. A closer examination revealed, however, that some of the specimens really had some small scales. These agreed perfectly with Nuttall's description. Nelson's specimens and my own, collected two years before, also on Green River, are the only ones that perfectly agree with Nuttall's description of *H. luteus*. His type was collected on the Ham's Fork of the Colorado of the West. What the present name of Ham's Fork is or its exact location I have been unable

to find; but from the route that Nuttall took it is undoubtedly some stream of the Green River system.

8. **Hymenopappus macroglottis** sp. nov.

Slightly tomentose perennial with a woody caudex. Stems several, 3–4 dm. high, striate, slightly floccose when young, with 1–3 leaves: leaves mostly basal, about 1 dm. long, bi-pinnately divided into linear lobes 8–25 mm. long, 1–2 mm. wide; stem-leaves generally simply pinnate or the uppermost simple: heads few, corymbose, 12 mm. high and 12–15 mm. broad, hemispherical: bracts oblong, with very narrow yellowish scarious margins: corolla yellow; tube about 2 mm. long; throat deeply campanulate, 3–4 mm. long, 3–4 times as long as the lobes: achenes elongated obpyramidal, about 5 mm. long, hirsute: scales of the pappus about 1 mm. long.

The long and broad lobes of the leaves and the long throat of the corolla distinguishes it from other species of the Rocky Mountains. The latter character it has common with only *H. lugens* Greene from southern California. This has, however, much more finely dissected leaves. *H. macroglottis* grows in arid regions from Texas to Arizona and north to Colorado or Utah.

ARIZONA: Oak Creek, 1883, *H. H. Rusby* (type).

NEW MEXICO: 1851–52, *Wright, 1252.*

TEXAS: Camp 42, 1853, *Bigelow, 730.*

COLORADO or UTAH: 1843, *Fremont.*